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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,557	11/29/2001	Toshiaki Takata	36856.583	1507

7590

02/28/2003

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EXAMINER

SUMMONS, BARBARA

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/995,557	Applicant(s) Takata
Examiner Barbara Summons	Group Art Unit 2817

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 1/25/02 (Pre-Amend A)
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-9 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-9 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☒ The drawing(s) filed on 1/18/02 is/are objected to by the Examiner
- ☒ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☒ All ☐ Some* ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

Art Unit: 2817

DETAILED ACTION

Drawings

1. Figure should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see e.g. pg. 2, lns. 1-2). See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: The specification is objected to because it contradicts itself. The abstract, at lines 12-14 thereof and the specification at page 6, lines 17-19, each recite that the "electrode duty of the series arm resonator is greater than the electrode duty of the parallel arm resonator" as does claim 1, at lines 15-17. However, the detailed description at page 13, line 10 through page 14, line 10 and page 14, line 20 through page 15, line 2 appear to describe beneficial results when the electrode duty of the parallel arm resonators is greater than the electrode duty of the series arm resonator as in Samples A and B in Fig. 6. The Examiner cannot determine which is correct, and the contradictory nature of the specification has resulted in the rejections which follow. Appropriate correction is required.

3. The amendment to the disclosure received 1/25/02 is objected to because of the following informality. If Applicant agrees to the following change, in order to avoid a complicated amendment of an amendment, the Examiner will make the change at the time of issue.

Art Unit: 2817

In the amendment to the first full paragraph on page 11, on the next to last line thereof, it appears that "(80 pairs in total)" should correctly be --(80 fingers in total)--.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-9 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the electrode duty of the series arm resonator is greater than the electrode duty of the parallel arm resonator" on lines 15-17 thereof. The Examiner cannot understand this limitation in light of the specification due to the contradictory nature of the specification. Clarification is required.

It should be noted that for purposes of art rejections that follow either of the series arm or parallel arm resonator having an electrode duty greater than the other will be considered to anticipate the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2817

7. Claims 1, 2, and 4-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishihara et al. U.S. 5,796,205 in view of Applicant's admitted prior art.

Figs. 21 and 22 of Nishihara et al. disclose a surface acoustic wave (SAW) filter comprising: a piezoelectric substrate 41; a plurality of one-terminal-pair SAW resonators including interdigital electrodes 45 and 47 of a series arm resonator 44 and a parallel arm resonator 46 that are coupled in a ladder arrangement; and the line/space ratios of the series and parallel arm resonators are such as to make the electrode duty of the series and parallel arm resonators 0.45 and 0.5, respectively (see col. 13, ln. 60 through col. 14, ln. 13 and Fig. 22). Therefore, the electrode duty of the parallel arm resonator (0.5) is greater than that of the series arm resonator (0.45), anticipating the claim limitation as far as it can be understood. Regarding claim 2, the substrate is disclosed to be 36°LiTaO_3 because the embodiments are combinable (see e.g. Fig. 27 col. 15, lns. 38-43 and col. 11, ln. 47 and col. 14, lns. 63-64). Regarding claim 4, see elements 31 in Fig. 8B and also Figs. 19 and 27. Regarding claim 8, the electrode duty of the series arm resonator is 0.45 which is about 0.5 or less.

However, Nishihara et al. does not disclose an insulating film of SiO_2 deposited on and adhered to the interdigital electrodes.

Applicant's admitted prior art (see Figs. 1A-1D) discloses that it is well known in the SAW filter art to cover interdigital electrodes with SiO_2 to, for example, adjust frequency bandwidths (see the spec. pg. 1, last full paragraph) of the device, wherein the thickness of the insulating layer inherently provides a predetermined frequency characteristic (see also other prior art of record cited as evidence).

Art Unit: 2817

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW filter of Nishihara et al. (Figs. 21 and 22) by having provided an insulating film of SiO_2 over the interdigital electrodes because it would have been well known by one of ordinary skill to have done so to provide the benefit of adjustability of frequency bandwidths as suggested by Applicant's admitted prior art (ibid.). Regarding claims 6 and 9, note that a filter is a communications device, and providing such a filter as an RF receiver filter would have merely been an extremely well known intended use of such SAW filters (see also other prior art of record cited below as evidence).

Allowable Subject Matter

8. Claim 3 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or fairly suggest a SAW filter having each of the specifically recited combinations of features, and especially having the specific recited thickness of the electrodes (claim 3).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit 2817

Allen et al. U.S. 5,726,610 provides evidence of using an SiO₂ insulating film covering electrodes (see Fig. 11) to achieve desired filter characteristics (see e.g. col. 5, lns. 8-10 and 18-29), and provides evidence of SAW filters in receivers and communications devices (see Fig. 1).

Yamada et al. U.S. 5,889,446 provides evidence of using silicon films to reduce pyroelectric effects (see the abstract and Fig. 2).

Kurahashi et al. U.S. 5,818,146 discloses covering electrodes of a SAW filter with an SiO₂ thin film (see col. 5, lns. 42-48).

Seki et al. U.S. 5,729,186 discloses that it is known to have an interdigital electrode with an electrode duty of less than 0.5 in a resonator in a SAW ladder filter (see Fig. 7).

Taniguchi et al. U.S. 6,404,101 has an inventor in common with this application and discusses electrode duty.

Nakao et al. U.S. 6,437,668; Tanaka et al. U.S. 6,037,700; and Minemura et al. JP 9-93072 each discuss SAW filters with various electrode duties, generally at or above about 60%.

11. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.



bs
February 21, 2003

Barbara Summons
Patent Examiner
Art Unit 2817